Chapter 16
COMMUNICATIONS SUBNETS

1601 INTRODUCTION

The capability of the MTWAN is reliant upon communications links which can support IP. Many military communications subnets were not initially designed to support IP traffic while modern commercial communications employed by the military may have this capability. The MTWAN represents the exploitation of commercial, and military subnets to enable networking to occur between mobile maritime forces. This includes the use of techniques to enable military bearers to support IP traffic.

1602 AIM

The aim of this chapter is to provide an overview of communications subnets and their utilisation within a MTWAN Architecture. Specific Communications subnet details are contained in the Annexes.

1603 OVERVIEW

a. A MTWAN consists of a number of complimentary communications bearers or subnets. Each subnet has unique attributes which make it suitable for specific environments. Figure 16-1 illustrates the communications subnets and their relationship within a MTWAN context. This adds complexity to a MTWAN architecture but is necessary as no single bearer can cater for all contingent situations. The subnets consist of:

- INMARSAT B,
- UHF SATCOM,
- HF 5066 IP,
- HF BLOS,
- HF ELOS,
- U/VHF LOS,
- GBS/TBS,
- ISDN.

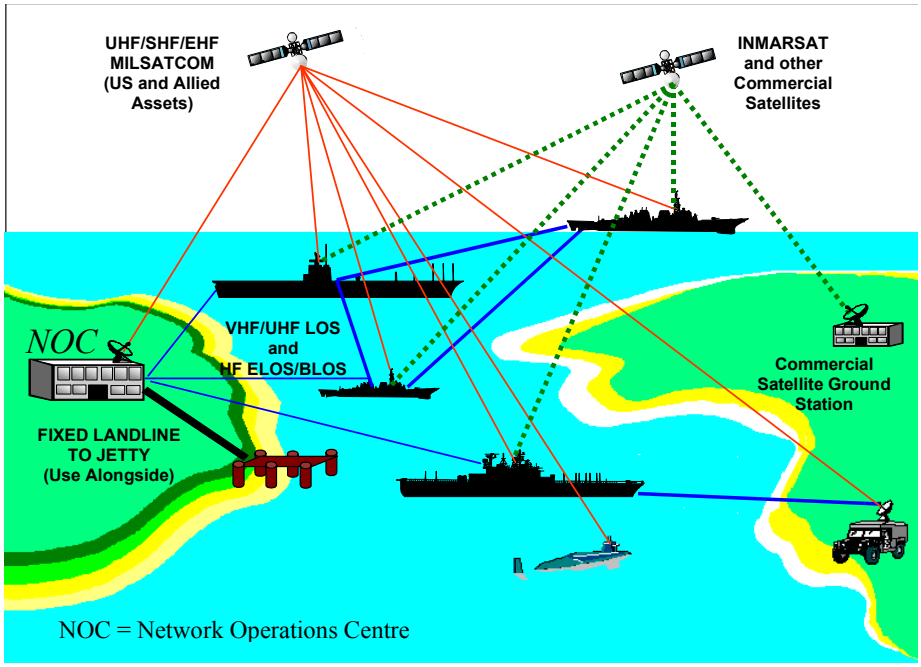

Figure 16-1: Communications Subnets

b. The capabilities provide by each subnet are summarised in Table 16-1. The link rate represent optimal conditions for the link. In some cases the link may be supporting more than one network. In multiple networks and in shared communications subnets the user data rate will be a portion of the link rate.

Subnet	Link Rate	Use	Notes
INMARSAT B	64Kbps	Main Data Bearer for intra task group use	• IP, point-to-point • Increased data rates and multiplex capability achievable with improved Modems
UHF SATCOM 25Khz	up to 48 Kbps	Email, Chat, Low data DCP, COP	• Limited IP capability, multi-member subnet
UHF SATCOM 5 Khz	up to 9.6Kbps	Email, Chat, COP	• Requires astute operation to optimise performance, multi-member subnet
HF 5066 IP	4.8-9.6Kbps	Email, Chat, COP, Low data DCP	• Data rate dependent on range and atmospheric propagation characteristics • High Overhead.
HF BLOS	4.8-9.6Kbps (SSB)	As for HF 5066 IP	• HF Skywave, Ranges of 2000-3000 Nm achievable • Increased data rates achievable with ISB

Table 16-1: Communications Subnets Matrix

Subnet	Link Rate	Use	Notes
HF ELOS	4.8-9.6Kbps (SSB)	As for HF 5066 IP	• HF Surface Wave, Ranges of 200-300Nm achievable • Increased data rates achievable with ISB
U/VHF LOS	64Kbps	Main Data Bearer for inter task group use over short distances	• Under development
GBS/TBS/IBS	512Kbps+	Broadcast of Imagery, Streaming Video and other real time data	• Capability available in many large platforms • Integration into MTWAN Under development
ISDN	64-512 Kbps	Main Data Bearer for intra task group use while units are alongside or for trunk communications between NOCs	

Table 16-1: Communications Subnets Matrix (Con't.)

1604 SUBNET RELAY

Subnet Relay (SNR) provides a multi-node, multi-hop, ship-to-ship network using IP protocols. SNR uses relay nodes to extend the coverage of a subnet beyond the single hop achievable with existing UHF LOS or HF ELOS circuits. It is envisaged that SNR will achieve tactical IP networking at sea using existing radio equipment. A relay capability is essential to provide effective ship-ship information transfer, and SNR fulfils the requirement to allow subnets to be formed when network connectivity between all Task Group members is not complete. SNR is seen as a viable solution to providing a near real-time tactical network, reducing the need for SATCOM, and providing communications redundancy. SNR is explained in Annex H.

1605 SUBNET MANAGEMENT

In a networked environment the subnets in use will be transparent to the user. Nevertheless the command should be cognisant of the capabilities and limitations of the subnets and their effect on IERs. This will be managed by the use of routing protocols, Channel Access Protocols (CAP), CAP Router Interface Units (CRIU), and dynamic bandwidth management techniques. These protocols and equipment enable the transfer of information among traditional ethernet LANs over RF bearers in such a way that the end user is unaware of the difference. Compression, bandwidth spillover and subnet autostart techniques are available or under development which enable communications and information managers to more effectively manage communications subnets to meet user demands.

1607 CONCLUSION

Military and Commercial communications subnets engineered to provide IP networking can support MTWAN operation in the maritime environment.